What is claimed is:

1. An amplification system comprising:

a mode selector that controls operation of the amplification system between a component mode and a composite mode based on a characteristic of an input signal relative to a threshold level; and

an amplifier system having a plurality of amplifiers that cooperate to amplify components of the input signal in the component mode to provide a reconstructed amplified representation of the input signal and a single amplifier that amplifies the input signal in the composite mode to provide an amplified representation of the input signal.

2. The system of claim 1, the amplifier system comprising a linear amplifier that receives the input signal in the composite mode along a composite signal path, and at least one additional amplifier that receives components of the input signal in the component mode along at least one different path from the composite signal path.

3. The system of claim 2, the linear amplifier also receives at least a portion of the components of the input signal along the composite signal path in the component mode.

4. The system of claim 1, further comprising a digital-to-analog conversion system that converts digital representations of the components of the input signal and digital representations of the input signal received from the mode selector to analog representations of the components of the input signal and the input signal which are provided to the amplifier system.

5. The system of claim 1, the components of the input signal comprising a phase modulated component of the input signal and an amplitude modulated component of the input signal.

6. The system of claim 5, the amplitude modulated component of the input signal being provided to a supply terminal of a power amplifier and the phase modulated component being provided to an input terminal of the power amplifier during the component mode.

7. The system of claim 5, the amplitude modulated component of the input signal being provided to one or more of the supply terminals of a Doherty amplifier and the phase modulated component being provided to an input terminal of the Doherty amplifier during the component mode.

8. The system of claim 7, the Doherty amplifier comprising a peak amplifier and a main amplifier, the amplitude modulated component modulating the peak amplifier and the main amplifier having a substantially fixed supply in the component mode, both the peak amplifier and the main amplifier having substantially fixed supplies in the composite mode, such that the input signal is provided to the main amplifier along a composite signal path in the composite mode.

9. The system of claim 7, the Doherty amplifier comprising a peak amplifier and a main amplifier, the amplitude modulated component modulating both the peak amplifier and the main amplifier during the component mode.

10. The system of claim 5, the amplitude modulated component being separate into at least two components that are amplified via respective amplifiers and recombined to modulate the supply terminal of the power amplifier.

11. The system of claim 1, further comprising a predistortion component that modifies one of the input signal and components of the input signal to mitigate output distortion of the multiple amplifier system.

12. The system of claim 1, further comprising a digital cross-cancellation component that generates a reference signal corresponding to a desired output signal

of the multiple amplifier system, the clean reference signal being combined with a portion of an output signal from the multiple amplifier system to determine an error signal, the error signal being inverted and combined with a delayed version of the output signal of the multiple amplifi r system to generate a final output signal.

13. The system of claim 1, further comprising at least one of a predistortion component that modifies at least one of the input signal and components of the input signal to mitigate output distortion of the multiple amplifier system, and a digital cross-cancellation component that generates a reference signal corresponding to a desired output signal of the multiple amplifier system, the clean reference signal being combined with a portion of an output signal from the multiple amplifier system to determine an error signal, the error signal being inverted and combined with a delayed version of the output signal of the multiple amplifier system to generate a final output signal.

14. The system of claim 13, further comprising a peak-to-average reduction (PAR) component that removes peaks portions of the input signal, the digital cross-cancellation component adding the peaks portions back to the final output signal.

15. The system of claim 1, further comprising a feedback path to compensate for variations in age and temperature of the amplifier system.

16. A transmitter comprising the amplifier system of claim 1.

17. An amplification system comprising:

a multiple amplifier system having a first amplifier, a second amplifier and a third amplifier; and

a mode selector that switches between a composite mode and a component mode based on characteristic of the input signal relative to a threshold level, the mode selector provides a first component of an input signal along a first path to the first amplifier and a second component of an input signal along a second path the second

amplifier in th component mode, and provides an input signal along a third path to the third amplifier in the composite mode.

18. The system of claim 17, the first component being an amplitude modulated component of the input signal that is provided to a supply terminal of the second amplifier *via* the first amplifier, and the second component being a phase modulated component provided to the input terminal of the second amplifier, such that the first and second amplifier perform a polar operation in the component mode to provide a reconstructed amplified representation of the input signal.

19. The system of claim 18, the first amplifier being one of a PWM, linear, or non-linear type modulator, the second amplifier being a linear or non-linear class type power amplifier and the third amplifier being a linear class type amplifier.

20. The system of claim 17, the second amplifier and third amplifier form a Doherty type amplifier, such that the second amplifier is a peak amplifier and the third amplifier is a main amplifier.

21. The system of claim 17, the first and second component being a first phase modulated component and a second phase modulated component that are combined to modulated the supply of the third amplifier.

22. An amplification system comprising:

means for separating an input signal into components;

means for switching operation of the amplifier system between a component mode and a composite mode based on a characteristic of the input signal relative to a threshold level;

means for providing a reconstructed amplified representation of the input signal from the components in the component mode; and

means for amplifying the input signal in the composite mode.

23. The system of claim 22, the means for separating an input signal into components comprising converting th input signal into an amplitude modulated component and a phase modulated component.

24. The system of claim 22, further comprising means for converting at least a portion of the input signal from the digital domain to the analog domain directly to a desired radio transmission frequency.

25. A method of operating an amplification system, the method comprising:

switching the mode of the amplifier system between component mode operation and composite mode operation based on a characteristic of an input signal relative to a threshold level;

providing components of the input signal to at least one amplifier during component mode operation to provide an amplified reconstructed representation of the input signal;

providing the input signal to a linear amplifier during composite mode operation to provide an amplifier representation of the input signal; and

selecting one of the amplified representation of the input signal and the reconstructed amplified representation of the input signal based on a present mode operation.

26. The method of claim 25, further comprising transmitting the selected representation of the amplified input signal to at least one receiver.

27. The method of claim 25, the providing components of the input signal to at least one amplifier during component mode operation comprising providing an amplitude modulated component to a supply of a power amplifier and a phase modulated component to an input of the power amplifier.